

Whiteboards: one tool to improve patient flow

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A focus on both quality and efficiency in health care has led to the implementation of innovations such as patient flow teams, bed managers and various support tools.^{1,2} The traditional whiteboard is a low-technology, low-cost, low-maintenance tool that can be an efficient medium for documenting patient status and progress.^{3,4} It can assist in timely completion of patient care activities and improve communication and teamwork, both within and across disciplines.^{4,5} It allows the sharing of information without the need for face-to-face meetings.⁶ However, it can also be used in a manipulative way, controlling access to information and workflow.^{4,7} Little attention has been paid to what influences successful integration of whiteboards into unit routines.

In 2008, we conducted a study of whiteboard use in three inpatient wards. Here we describe their structures, processes and perceived outcomes.

METHODS

We used a case study method⁸ with four nested cases in one Queensland health service district. To conceptualise the study we used Donabedian's framework (comprised of three elements: structure, process and outcome)⁹ to frame the quality evaluation of health service performance. Quality is assessed by appraising structures and processes and linking these to outcomes, on the assumption that structures influence processes, which in turn influence outcomes.^{9,10} Structures include physical and organisational properties; processes are what is actually done; and outcomes are what is accomplished.¹⁰ To evaluate an aspect of quality, we looked at causal relationships between the three elements.

Setting

Whiteboards were installed in three inpatient wards (two medical, one surgical) in a university-affiliated regional teaching hospital and in a day clinic in the same health service district.

In the clinic, where patients had to be seen by a number of health professionals, nursing staff suggested to the rest of the multidisciplinary team that a whiteboard

ABSTRACT

Objective: To describe the integration of whiteboards into ward routines in one Queensland health service district (HSD).

Design and setting: Case study involving placement of whiteboards in three inpatient wards (two medical, one surgical) in a university-affiliated regional teaching hospital and in a day clinic in the same health service district. Data collection methods included 45 hours of observation of four whiteboards and 62 staff over 2 months, 11 in-depth interviews with nursing and allied health staff, and photographs of the whiteboards taken at intervals. The study was conducted from March to August 2008.

Main outcome measures: Structures, processes and perceived outcomes of the use of whiteboards.

Results: The physical configuration of the whiteboards did not vary, but their content and usage by various professional groups fluctuated. Whiteboards were most successfully integrated in the clinic, where they became an integral part of multidisciplinary rounds, and were updated and referred to several times each day. They were partially integrated into the two medical wards, with various health professionals updating and referring to the whiteboard. In the surgical ward, a nursing assistant updated the whiteboard, but it was not referred to by others. Staff in the clinic and on the medical wards perceived that whiteboards facilitated timely referrals, improved patient flow and enabled timely and better discharge planning, but surgical nursing staff described them as an imposition and a cause of conflict among clinical team members.

Conclusions: Whiteboards have the potential to improve patient flow, but a planned approach to their use is required. Issues relating to the use of whiteboards, including staff buy-in, discharge planning and patient privacy, need to be addressed.

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might help share patient progress information. All groups were then involved in the planning, training and implementation phases.

In the hospital, whiteboards were installed because an examination of patient flow identified a number of issues relating to referrals and discharge planning and a lack of standardisation of work routines across units. When the idea of a whiteboard was raised by the patient flow team, it was embraced by the medical nurses. Shortly afterwards, it was rolled out throughout the hospital. A nurse unit manager, seconded to the patient flow initiative, led the roll-out, and training sessions were delivered to doctors, nurse unit managers and allied health professionals.

Our study was conducted from March to August 2008, 10–12 months after the four whiteboards had been installed.

Sample

The focus of our observations was staff who either reviewed or wrote on a whiteboard.

Some of these people were also interviewed. Participants were purposively chosen for interviews with the aim of achieving variation in type of worker and type of unit.

Data collection

We used three forms of data collection: in-depth, semi-structured, audiotaped interviews; semi-structured observations; and photographs of the whiteboards in each unit. The interviews were the primary source of data, with the observations and photographs used as a triangulation technique to substantiate our findings.

Interview questions explored the implementation and use of whiteboards. Examples of questions included:

- What do you think is the purpose of the whiteboard?;
- What do you think should be written on the whiteboard?; and
- How do you refer to the whiteboard?

Participants were interviewed in a quiet location in the hospital. Interviews were transcribed verbatim and checked for accuracy.

1 Participant characteristics

Characteristic	Frequency (n=11)
Participant group	
Registered nurse (bedside)	1
Nurse manager or educator	4
Allied health care professional	4
Nursing assistant	1
Unspecified*	1
Age group (years)	
< 30	2
30–39	3
40–49	3
≥ 50	3
Work pattern	
Full-time	10
Part-time	1

* Person declined to be identified.

Observations focused on the structures and processes surrounding whiteboard use, including who wrote on the whiteboard (and when), who read it, and what types of staff interactions occurred at the whiteboard. Observations were recorded on a semi-structured data collection form. A total of 45 hours of observation were undertaken. Each whiteboard was photographed once to aid understanding of the whiteboard structures.

Data analysis

Data were analysed using the case analysis technique.⁸ This involves an iterative explanation-building process. The objective is to refine a set of ideas and link these to the data. First, data were categorised into the domains of structures, processes and perceived outcomes. Structures were defined, and then propositions about differences in engagement or use of the whiteboard were generated. Processes and outcomes were identified from comparisons of use across cases. Data analysis continued until a final set of explanations was generated.

With each iteration, there was constant reference to the original purpose of the enquiry, and attempts were made to consider alternative, plausible explanations.⁸ One researcher led the analysis, with other researchers meeting to scrutinise, discuss and question the preliminary findings to refine the quality of the analysis.

Ethics approval and consent

Ethics approval was obtained from the human research ethics committees of Griffith University and the Gold Coast Health Service District. All staff who were approached consented to take part in the study. Patient consent was not required.

RESULTS

Over a 2-month period, 11 participants were interviewed. Sixty-two staff (40 nurses, 11 doctors, 10 allied health professionals and one nursing assistant) were observed engaging in some way with the whiteboard, generally writing on it or reviewing it.

The interviewees were five registered nurses, four allied health professionals, one assistant in nursing, and one other person who declined to be identified (Box 1). All doctors who were approached to be interviewed declined, citing work pressures as the reason, but all others who were approached agreed to be interviewed. The structures, processes and outcomes identified are summarised in Box 2 and described in more detail below.

Structures

Four structural elements of whiteboard communication were identified: their physical properties, their physical location, concurrent permanent documentation, and the staff who used them. All whiteboards were the same dimensions (280 cm [width] × 200 cm [height]). They were divided into columns for bed numbers, consultant doctors, common allied health referrals, diagnostic tests, discharge medications, and expected date of discharge. Two different coding systems were used to indicate referrals (Box 3).

All whiteboards were located in high-traffic areas. In the three inpatient wards, they were near the single nurses' station and were readily visible to staff, patients and visitors. Participants explained that, after consultation with the hospital's legal department about patient confidentiality, bed numbers rather than patient names or initials were used. In the clinic, the whiteboard was located out of sight of patients and visitors, and thus contained more detailed information, which seemed to enhance its usefulness. Easy visibility for staff appeared to be important for its use.

In the inpatient wards, some form of concurrent permanent documentation, either paper or electronic, was developed to gather information that needed to be stored permanently in the patient's health record or had to be transmitted to others when patients were transferred from unit to unit. One nurse commented:

We use a referral form ... [I]f the patient did move, the information would still be documented there ... [Y]es, you might say that's a duplication, but it's a slight safety check.

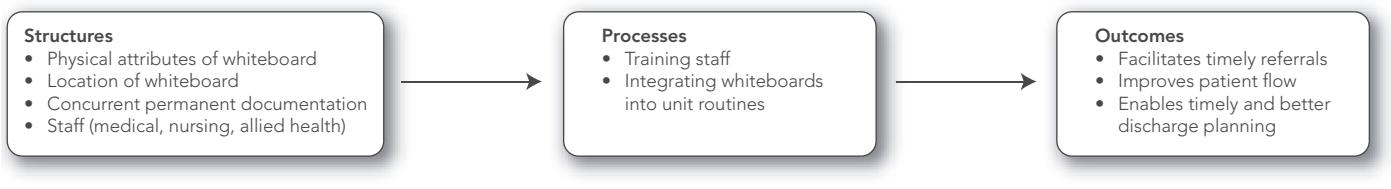
In the medical wards, doctors, nurses and allied health professionals interacted with the whiteboard individually and occasionally together. In the surgical ward, only a nursing assistant was observed to interact with the whiteboard, writing patient information on it.

In the clinic, doctors, nurses and allied health professionals interacted with the whiteboard both individually and as a team.

Processes

Two processes were identified: training staff in the use of whiteboards, and integrating whiteboards into daily routines. Small- and large-group training was delivered to staff, with a focus on the results of the patient flow project and an explanation of how the whiteboards could both standardise and improve ward routines. After this initial training, there was no ongoing training, which meant that some new and rotating staff did not receive training. This was not a

2 Overview of the structures, processes and perceived outcomes of whiteboard use



3 Two examples of whiteboard codes

Code	Meaning	Code	Meaning
/	Referral request has been made	\	Action required
△	Referral accepted; patient is being assessed and/or treated	×	Action completed
△	Service or treatment complete		

problem in the clinic, as staff turnover was low, but may be one reason why the whiteboard was not really used in the surgical ward. In the clinic and medical wards, staff described how they were involved in the planning phase, which they viewed as a key factor in successful integration of the whiteboard into work routines. Surgical nursing staff commented that they did not have input into its planned use and did not actively interact with it, despite the training session they attended initially.

Integration of the whiteboards into unit routines was accomplished to varying degrees. In the day clinic, nurses, doctors and allied health staff inspected and updated the whiteboards regularly throughout the shift, and multidisciplinary clinic rounds were physically located at the whiteboard. One allied health professional said:

It's a visual way of communicating with all the different allied health [staff] that we would easily see when we came on the ward.

On the medical wards, information was generally updated by nurses. Doctors, nurses and allied health professionals referred to the whiteboards individually, but doctors did not integrate them into their rounds.

On the surgical ward, a nursing assistant was observed writing information on the whiteboard, but no other staff members were observed looking at it. These findings were supported by interview data. The nursing assistant stated that, to her knowledge, only the bed manager used the whiteboard.

Outcomes

The major outcome we identified was the perception that whiteboards facilitated timely referrals, improved patient flow and enabled timely and better discharge planning, such as writing discharge medication scripts. A nurse noted:

It's about trying to get discharges happening in a timely manner. There is a whole set of processes that also need to happen, not just the doctor part of it all

but all the additional services that have to kick in ahead of time in order for a patient to be discharged appropriately.

Participants from the clinic viewed the whiteboard as a vital tool that helped the multidisciplinary team communicate with each other. Erasure of the whiteboard at the end of the day signalled completion of the day's work.

Implementation was not successful in the surgical ward, where the whiteboard was viewed as an imposition and a cause of conflict among various professional groups.

DISCUSSION

The patient-centred nature of whiteboard use is aligned with current trends in information transfer. Having health professionals document information in a way that is readily visible can facilitate accurate and appropriate clinical judgements. In the context of information sharing, whiteboard use also has the capacity to promote teamwork and accountability,⁶ particularly with timely scrutiny of one another's plans and reports.⁴ Three key issues surrounding the use of whiteboards emerged from our study: staff buy-in, discharge planning and patient privacy.

For whiteboards to be effective communication tools, the active and willing support and participation of staff is imperative. There needs to be a powerful, guiding coalition to effect change, and this is best achieved with joint, multidisciplinary, systematic planning on the basis of shared goals and a shared vision.¹¹ Our study showed that, when staff perceived they did not have a part in the planning and implementation of a new resource, they did not develop ownership of it and did not see it as a useful tool. Rather, it was seen as a burden, an imposition of extra work, and a source of conflict. This finding highlights the importance of a planned approach to change. Establishing a sense of urgency for change on the basis of patient safety and ensuring that this is communicated widely at the ward and institutional levels can be per-

suasive for staff members who may initially be resistant to change.¹¹

The notion that the whiteboard facilitated patient flow and discharge planning was a consistent finding and has been recognised previously.^{7,12} Our observations are consistent with the findings of Xiao and colleagues that whiteboards supported collaborative work in the emergency department.⁵ Whiteboards allow tasks to be articulated, managed and tracked. They assist in resource planning, such as bed availability, and facilitate both synchronous communication (in which the message is sent and received at the same time) and asynchronous communication (in which the receiver decides when to receive the message).^{13,14} Others have noted that whiteboards and other communication tools, such as electronic dashboards, can actually be used to control practice.^{4,7,13} However, our study did not highlight the "game playing" that others have noted.^{4,6}

Joint medical and nursing rounds (which may shorten hospital length of stay^{15,16}) did not occur in the three inpatient wards we studied. In such instances, where medical and nursing rounds are not conducted jointly, the potential for the whiteboard to act as synchronous or asynchronous communication channel is unlikely to be realised unless short updates between doctors and nurses occur at the whiteboard or doctors record their plans on it. Given their workloads, it is no wonder that doctors, nurses and allied health professionals find this difficult. In previous studies, health professionals have argued that, because of time restraints, the need for efficient and relevant information sources is imperative to support collaboration and information needs in patient care.³ It seems self-evident that the information must also be accurate. Thus, if whiteboards are used, there must be a clear line of responsibility for updating the information on them. Further, making reviews of the whiteboard part of ward rounds formalises its integration into ward routines.

Somewhat surprisingly, the issue of patient privacy and confidentiality of information did not feature in our findings. However, the state's confidentiality guidelines¹⁷ and the hospital's legal department were consulted in the planning phase to address issues related to patient privacy. Unlike other hospitals, where patients' names are recorded,⁷ the nurse unit managers in the hospital we studied made the decision to use bed numbers as the only

reference. It is self-evident that the physical location of whiteboards may be a significant factor in ensuring patient privacy, but finding appropriate locations for them may be difficult.

While our study provides some new insights into the integration of whiteboards into hospital routines, it has a number of limitations. First, it was conducted in one health service district only, and thus contextual issues may limit the generalisability of our results. On the other hand, four diverse units were involved, with wide variation in how the whiteboards were used, providing a rich breadth of data. A second limitation was that a key professional group, medical doctors, declined to be interviewed. There is no way of knowing how their perceptions might have influenced the data analysis and findings. Finally, we relied on participants' perceptions of the benefits of the intervention, which may have been biased.

In conclusion, our study of the use of whiteboards in four units in one health service district showed that whiteboards facilitated timely referrals and improved patient flow and enabled timely and better discharge of patients. However, for whiteboards to be integrated into unit routines, staff require training in their use and need to believe that they have been involved in the planning phase. Importantly, careful consideration of issues surrounding confidentiality of information can overcome potential breaches to patient privacy.

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COMPETING INTERESTS

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